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FIGURES ON USSR ELECTRIC POWER CONSTRUCTION AND OUTPUT

/Numbers in parentheses refer to appended sources./

According to the Fifth Five-Year Plan, the total capacity of steam electric power stations will be doubled mainly by enlarging existing ones. The total capacity of the hydroelectric power stations will be tripled by having in operation the Kuybyshevskaya GES with a capacity of 2,100,000 kilowatts, the Kamskaya GES, Gor'kovskaya GES, Mingechaurskaya GES, Ust'-Kamenogorskaya GES, Narvskaya GES in the Estonian SSR, and others with a total capacity of 1,916,000 kilowatts.

In addition to the Stalingradskaya GES and Kakhovskaya GES, which are now being built, construction of a number of new GES will be started during the Five-Year Plan. These include the Cheboksarskaya GES on the Volga River, Votkinskaya on the Kama River, Bukhtarminskaya on the Irtysh River, Kaunasskaya on the Neman River in the Lithuanian SSSR (1), and a GES on the Ob' River near Novosibirsk.(2)

Since the Elektrosila Plant imeni Kirov in Leningrad manufactures most of the hydroturbines for the GES, the plant will have to increase its production 7.8 times over 1950 by the end of the Fifth Five-Year Plan to equip the projected GES.(3) The production of steam turbines will be increased 2.3 times in the same period.(4)

Construction of the Nizhne-Svirskaya GES, which was put into operation on 19 December 1933 with an installed capacity of 116,000 kilowatts, cost 2,600 rubles for one kilowatt of its capacity.(5)

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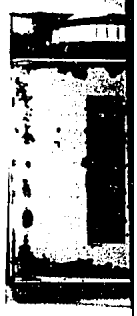

In connection with determining coefficients for converting 1945 prices into 1949 prices, Gidroenergoproyekt has analyzed the estimates for construction of the Kamskaya, Mingechaurskaya Verkhoturskaya, Dzaudzhikauskaya, and Khramskaya GES. The work resulted in the tables given below which contain figures representing percentages of the total amounts of the estimates as well as average indexes for comparison.

Table 1

GES	Payroll	Cost of Material at the Constr Site Warehouse	Exploitation Cost of Machinery	Other Direct Expenditures	Total
Kamskaya	16.1	59.9	22.5	1.5	100
Mingechaurskaya	6.2	49.5	31.5	2.8	100
Khramskaya	15.3	63.0	13.2	8.5	100
Verkhoturskaya	20.5	61.9	15.0	2.6	100
Dzaudzhikauskaya	24.5	65.8	7.0	2.7	100
Average indexes	16.2	55.4	25.9	2.5	100

A further percentage breakdown of estimates for two GES is given in Table 2 below:

Table 2

Items of Estimates	Kamskaya GES	Mingechaurskaya GES
Basic pay		
Construction workers	13.7	14.7
Installation workers	2.4	1.5
Total	16.1	16.2
Materials		
Purchase price	43.1	30.4
Railroad freight	5.5	9.2
Local transportation charges	5.7	4.3
Handling charges	2.9	3.9
Cost of packing materials and packing charges	1.4	0.8
Procurement and storage charges	1.3	0.9
Total	59.9	49.5

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Table 2 (Contd)

Items of Estimates	Kamskaya GES	Mingechaurskaya GES
Operation of Machinery		
Regular expenses*	9.1	17.1
Wages	2.7	3.8
Electric power	8.8	6.8
Coal and firewood	0.3	0.4
Liquid fuel	1.5	3.2
Water and air	0.1	0.2
Total	22.5	31.5
Others		
Amortization of railroad tracks	1.2	2.7
Miscellaneous	0.3	0.1
Total	1.5	2.8
Grand total	100.00	100.00

* Regular expenses include costs of transportation of machinery, their mounting and dismantling, amortization, repairs, lubrication, including the cost of lubricants, and expenses of the organization in charge of the machinery.

Table 3

Items of Estimates	Kamskaya GES Percentage of: Total	Kamskaya GES Percentage of: Total Less Expenditures on Reservoir	Mingechaurskaya GES Percentage of: Total	Mingechaurskaya GES Percentage of: Total Less Expenditures on Reservoir
Construction and installation work	64.4	61.0	65.0	68.5
Equipment				
Permanent	9.8	12.9	10.9	12.5
Temporary	6.7	8.8	5.1	4.4
Transportation, procurement, and storage charges	1.1	1.4	1.1	1.1
Other expenses				
Clearing and preparing reservoir site	23.9*	--	5.1*	--
Planning and surveying works	5.4	7.1	7.0	6.3
Miscellaneous	1.9	2.5	1.0	2.2
Unforeseen works	4.8	6.3	4.8	5.0
Total	100.00	100.00	100.00	100.00

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* Since the costs of clearing and preparing the sites of the reservoirs included in the general estimates are not based on engineering estimates but on financial considerations, they cannot be too accurate; consequently, the second column under the heading "Percentage of Total Less Expenditures on Reservoir" is provided.

Table 4 shows the average outlay of basic materials per one million rubles of the cost of construction and installation work based on the norms and prices of 1945. The table is compiled from the estimates for seven GES: Kamskaya, Mingechaurskaya, Verkhne-Svirskaya, Verkhoturskaya, Khramskaya, Krasnopolyanskaya, and Dzaudzhikauskaya. It also shows the minimum and maximum outlay of materials, and, for comparison, the actual figures on the Dnepro GES construction converted into 1945 prices.

Table 4

Outlay of Materials per One Million Rubles of Cost of Construction and Installation Work

Materials	Average	Maximum	Minimum	Actual at Dnepro GES
Round timber, (cu m)	1,020	1,525	679	1,738
Cement (tons)	382	657	338	476
Steel (bars, structural and sheet piling) (tons)	171	226	46	79
Rails and parts (tons)	10.6	32.5	0	14.5
Sand (cu m)	1,241	1,637	1,070	683
Gravel and crushed stone (cu m)	1,733	2,352	1,413	1,550
Stone (cu m)	770	1,109	520	663
Bricks (thousands)	117	154	32	48
Lime (tons)	32	39	19	20

Table 5 shows the costs of basic materials expressed in percentage of the costs of construction and installation work, and in percentage of the total estimated costs for the Kamskaya and Mingechaurskaya GES.

Table 5

	Kamskaya GES Percentage of Cost of:		Mingechaurskaya GES Percentage of Cost of:	
	Constr and Installation Work	Total Estimate	Constr and Installation Work	Total Estimate
Lumber	3.06	1.42	2.55	1.66
Cement	3.38	1.57	2.86	1.86
Ferrous metals	12.11	5.63	6.11	3.97

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Table 5 (Contd)

	Kamskaya GES Percentage of Cost of:		Mingechaurskaya GES Percentage of Cost of:	
	Constr and Installation Work	Total Estimate	Constr and Installation Work	Total Estimate
Rails	0.24	0.11	0.39	0.25
Sand	0.67	0.31	0.31	0.20
Gravel	1.31	0.61	1.42	0.92
Stones	0.56	0.26	0.65	0.42
Bricks	2.43	1.13	1.44	0.94
Lime	0.24	0.11	0.57	0.37
Total	24.0	11.15	16.30	10.59
Grand total including transportation charges	33.36	15.50	26.56	17.26 (6)

Volkhovskaya GES was put into operation on 19 December 1926; during 5,500 hours of annual operation, it produces 356 million kilowatt-hours at the rate of 1.8 kopek for one kilowatt-hour. A large steam electric power station produces one kilowatt-hour at the rate of 5 kopeks.

Nizhne-Svirskaya GES, which was completed on 19 December 1933, could at that time develop up to 125,000 kilowatts with an average annual output of 600 million kilowatt-hours. It has four hydroturbines of 29,000 kilowatts each and two of 2,500 kilowatts each. Its power costs 2.1 kopeks per kilowatt-hour.

The completed Dnepro GES had nine aggregates of 62,000 kilowatts each totaling 556,000 kilowatts and a tenth aggregate for its own use of 3,500 horsepower. Annual output was 2.9 billion kilowatt-hours at 0.6 kopek per kilowatt-hour.(5)

The cost of electric power in 1950 was below the cost in 1945 in comparable prices by over 25 percent. The Five-Year Plan for reducing the cost of electric power was fulfilled in $3\frac{1}{4}$ years. During the last 4 years of the planned period (1948 - 1951), about one billion rubles of extra profit were made over the planned profit by improving the performance of power systems and power stations, by reducing losses of power through leaks, and by reducing the number of personnel.(7)

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